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established by means of the open water-suffused stomata. This would account for the effectiveness of the film at night and for its lack of effectiveness with *Cyperus* with its very narrow stomata. The authors state that there are difficulties in the incipient guttation explanation as applied to excised leaves.—WM. CROCKER.

Turgor movements.—BLACKMAN and PAINE,[19] by use of a special conductivity cell, have studied the conductivity of the liquid extruded from the lower half of the excised pulvinus of *Mimosa pudica* due to the shock stimulus. The shock response gives an increase in conductivity, but not nearly enough to attribute the contraction to increased extrusion of solutes. They believe, therefore, that the contraction is due to a sudden condensation of solutes within the pulvinal cells of the lower half of the pulvinus. They consider the conductivity method far superior to the plasmolytic method used by previous authors, for it answers directly the amount of movement of solutes. Under certain conditions they get autonomic movements of this organ similar to those of the leaflets of *Desmodium gyrans*. A slow rise of temperature up to 50° C. shows little increase in exosmose of electrolytes from this organ. The increase of permeability at higher temperatures seems to be due to lethal irreversible changes.—WM. CROCKER.

Alternation of generations in Padina.—*Padina variegata*, one of the Dictyotaceae, is abundant at Beaufort, North Carolina, where it has been studied by WOLFE.[20] Sperms, eggs, and tetraspores are borne on 3 separate plants which look alike in the vegetative condition, but which are easily recognized during reproduction. Tetraspores give rise to only male and female plants in approximately equal numbers, so that sex is probably predetermined during the reduction division in the tetraspore mother cell. Fertilized eggs produce only tetrasporic plants, so that there is an alternation of sporophyte and gametophyte generations. Eggs often germinate without fertilization, but plants of such parthenogenetic origin do not mature. It would be interesting to know the chromosome numbers, especially in the parthenogenetic plants, and we hope that WOLFE, who is familiar with the cytological technique of the algae, will investigate this phase of the problem.—C. J. CHAMBERLAIN.

The luminous moss.—TODA[21] has made a physiological study of *Schistostega osmundacea*, the so-called luminous moss, his material having been obtained from a cave in Japan. He found the optimum intensity of light as well as the minimum and maximum intensities in terms of Bunsen's unit. In a dark place the protonema can live for 7 months without producing a leafy shoot. He observed also the movement of "chomatophores," which became scattered in a day when the protonema is placed in light, and when the direction of light is changed they all turn toward it in 7–10 days. Blue and violet light proved to be more favorable than any other of the visible rays, excepting of course white light. The optimum temperature for the development of the leafy shoot is 16–25° C.; the protonema does not die so long as the temperature is above −20.5° C., but the leafy shoot dies at −18° C. The spore at a temperature of 16–25° C. germinates in one month.—J. M. C.

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[19] BLACKMAN, V. H., and PAINE, S. G., Studies in the permeability of the pulvinus of *Mimosa pudica*. Ann. Botany **32**:69–85. 1918.

[20] WOLFE, J. J., Alternation and parthenogenesis in *Padina*. Jour. Elisha Mitchell Scientific Soc. **34**:78–109. 1918.

[21] TODA, VISCOUNT YASUMOCHI, Physiological studies on *Schistostega osmundacea* (Dicks) Mohr. Jour. Coll. Sci. Tokyo **40**:no. 5. pp. 30. *pls. 2.* 1918.

Angiosperm wood lacking vessels.—BAILEY and THOMPSON,[22] in continuing their work on certain genera of angiosperms in which true vessels are absent from the normal wood of the stem, have obtained additional evidence. Their attention had been called to the occurrence of vessel-like structures in injured roots of a species of *Drimys*, which might indicate that the ancestors of the 3 genera investigated possessed true vessels. An examination of these structures has led to the conclusion that they are not vessel-like in structure, but are typical tracheids, which occur as well in uninjured stems of the 3 genera. They maintain, therefore, that true vessels do not occur in the xylem of these genera, and that there is no evidence that their ancestors possessed true vessels.—J. M. C.

Permeability.—PAINE and SAUNDERS[23] find that the testa of the pea is impervious to various reagents dissolved in water (copper ferrocyanid, sodium chloride, safranin) due to a waxy bloom deposited on the outer surface. This bloom is easily rubbed off so that the testa becomes pervious. In the wrinkled peas the bloom rubs off on the wrinkles, leaving the depressions still impervious, while in the smooth pea the bloom rubs off uniformly on the whole surface. It is interesting to find such a superficial layer responsible for the peculiar permeability characters of seed coats, for these characters are generally determined by deeper layers.—WM. CROCKER.

Agaricaceae of Michigan.—KAUFFMAN,[24] in connection with his very full presentation of the Agaricaceae of Michigan, has monographed *Russula* (pp. 118–167), *Pholiota* (pp. 289–314), and *Cortinarius* (pp. 314–442), as represented in the state. In *Russula* he recognizes 53 species, 3 being new and 27 edible; in *Pholiota* 26 species, 4 of which are edible; in *Cortinarius* 154 species, 13 of which are new and 10 edible. As an illustration of the activity of CHARLES

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[22] BAILEY, I. W., and THOMPSON, W. P., Additional notes upon the angiosperms *Tetracentron*, *Trochodendron*, and *Drimys*, in which vessels are absent from the wood. Ann. Botany **32**:503–512. *pl. 16. figs. 9.* 1918.

[23] PAINE, S. G., and SAUNDERS, L. M., On a peculiarity exhibited by the testa of wrinkled peas. Ann. Botany **32**:175. 1918.

[24] KAUFFMAN, C. H., The Agaricaceae of Michigan. Mich. Geol. and Biol. Survey, Publ. 26. Biol. Series 5. December 1918.